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EMERGING ISSUES IN AFRICAN POPULATION AND HOUSING CENSUS PROGRAMMES

PRE-ENUMERATION CARTOGRAPHY

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I. INTRODUCTION

1. In a census programme, cartography plays an important role before and after enumeration.

2. In fact, among the preparatory activities of a population census, cartography occupies a prominent place by virtue of its role:

- It helps ensure a thorough data collection, thus facilitating national organization by determining the requirements in terms of material and human resources.

3. After the enumeration, cartography comes in to:

- provide from its output a sampling frame for most surveys;(1)
- facilitate the interpretation and the analyses of results by the demographers by means of diagrams and graphs;(2)
- facilitate the understanding of the data by planners and other decision makers.
- facilitate the dissemination of data among wider populations.

This document deals solely with pre-enumeration cartography.

II. CARTOGRAPHY PROGRAMME

4. Before undertaking any operation, it is necessary, first and foremost, to prepare a well defined cartography programme based on clear and accurate short, medium and if possible long term objectives.

5. In drawing up such a programme, account should be taken of available human, material and financial resources; the methodology, organization and a definite calendar should also be prepared.

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(1) Due to the very poor development of the rural maps in the African region, the area units set up within the framework of population census are often used as basis for sampling even for agricultural surveys.

(2) It should be noted that the task of the cartographer in preparing graphs and diagrams is made much easier today with the introduction of computer integrater software packages which make it possible to switch from one software to another. For example, WINDOWS on a micro-computer makes it possible to move from a table to a graph. There exist other graphic softwares such as micro-soft MS CHART which allows for a better representation of census data.

III. TRAINING OF CARTOGRAPHERS AND CONDUCT OF FIELD WORK

6. For better harmonization, it is strongly recommended that training should be done at only one centre (or at most in 2 or 3 centres) using a training manual.

7. This training should cover all the tasks to be done by the field team. In addition to lectures on concepts and procedures, the training should include practical exercises both in the class room and in the field, in the urban as well as rural areas. The average duration of the training should be 2 to 3 weeks.

8. The instructions or manuals for the cartographer should, by way of directives, show how the cartographic work is to be carried out. These instructions or manuals must be clear and accurate and should include in an annex the technical guidelines to which he would refer as and when necessary.

9. Field work

- To ensure an efficient sectoral distribution, it is recommended that rather than a specialization according to type of activity, each team member should be able to carry out any of the activities involved in the field mapping.

- Where different administrative districts are to be covered by the same team or two different teams, steps should be taken to ensure that there is close co-operation of all concerned and co-ordination of work so that no area is left uncovered, and also that the risks of overlapping are minimized.

- It cannot be overemphasized that the most efficient delineation is the one done in the field by the mapping assistant and reviewed by the team leader. Only some minor changes would have to be done in the Central Census Office. It is necessary therefore that the principles to be adopted when making the delineation should be clearly defined.

10. The very rough estimates of the population of the localities and their wrong plotting more often than not are the causes of poor delineation. It is necessary therefore that special attention be paid to these two elements.

11. Since the cities and practically the big metropoles constituted problematic areas on account of their rapid development, the strategy of delaying mapping work in respect of these cities and metropoles till a period very close to the census date would be facilitated if recent aerial photographies of the cities are available. However, taking pictures for this purpose alone would be very costly. Consequently, it would be strongly recommended that satellite pictures with a 10m panchromatic resolution (SPOT type) be used.

12. Field work control through inspection tours would be strongly recommended.

IV. OTHER DOCUMENTS TO BE PREPARED

13. In addition to the maps and EA/SA description sheets, it would be strongly recommended that the cartography unit prepare the following documents:

- the geographical code of the different administrative units and that of provisional area units. In preparing these codes, the cartographer shall work in close co-operation with the demographer and statistician. Steps should be taken to make this first code flexible and simple, and uniform throughout the country;

- recapitulative index cards spelling out personnel and material needs. This card prepared by the administrative districts enables the officers to carry out field operations (data collection), to know the required number of data collection staff by category, to assess the necessary logistic facilities by type as well as the supplies to be delivered to each administrative unit;

- the document entitled "Enumerator base and Controller base". This document defines the areas where it would be advisable that the enumerator/supervisor should be recruited so as to cut down on operation costs and facilitate control;

- EA file. This file is vital for the computer coverage checking.

V. PRESERVATION OF CARTOGRAPHIC DOCUMENTS

14. In most of the countries OZALID type of blueli graphic paper was used for the reproduction of cartographic documents. It should be noted that long storage of such papers which are particularly sensitive to variations in the hygrometric state of the air and the surrounding temperature demands that special conditions be created, entailing additional running expenses, particularly electricity costs. It would be recommended therefore that microfiche, film or simple tracing paper be used for the preservation of draft maps. These documents should be kept in an area reserved for the purpose. The area should be equipped with maps filing cabinets (preferably vertical cabinets for the last two types of material.) There should be strict rules governing the use of this area. Under no circumstance should any draft maps be removed. They should be consulted on the spot. A rule should be laid down to govern their removal.

15. Good preservation of the documents and their constant up-dating are the essencial conditions for reducing cartographic operation costs of subsequent censuses and inter-census surveys. Special attention should therefore be given to this aspect of the operation.

16. The printing in 3 or 4 colours of the maps of different administrative districts would improve the presentation and facilitate the reading of the documents. Publication of atlases of inhabited areas would be of great interest to the various planners and researchers etc.

17. Methodological and administrative reports published at the end of cartographic operations do not often provide statistics for instance on the performance of the field officers and of draughtsmen, the fuel consumption of vehicles by locality, the cost of the different phases of operation etc, whereas such data could be very useful for programming other similar operations. It is recommended that steps should be taken to overcome this shortcoming during future censuses.

VI. CARTOGRAPHY EVALUATION

18. A first evaluation is made after processing the questionnaire prepared for that purpose. The following three major questions are generally asked:

- How many localities have not been plotted or identified during the field mapping?
- How many cases of wrong plotting of locality have been noted?
- How many cases have necessitated changes in the areas delineated during the field mapping?

19. A more detailed evaluation is provided by calculating the population variances (Vix) and household variances (Viy) of the various areas created first at the administrative districts level and then at the total country level (Vx and Vy). The standard deviations observed (δ) will then be calculated.

20. The various statistics for the whole country can be obtained using the following formulae:

$$Vx = \frac{1}{n} \left(\Sigma n_i V_{ix} + \Sigma n_i (\overline{X}_i - \overline{X})^2 \right)$$

$$V_y = \frac{1}{n} \left(\Sigma n_i V_{iy} + \Sigma n_i (\overline{Y}_i - \overline{Y})^2 \right)$$

Where n = total number of enumeration areas (EA) in the entire country;

n_i = number of EA in district;

V_{ix} and V_{iy} = population variance and household variance respectively in district

X $\bar{X}_i$ and $\bar{Y}_i$ - average number of persons and average number of households in province i

$\bar{X}$ and $\bar{Y}$ - average number of persons and average number of household in the entire country.

Remark: Where the urban population represents an appreciably high percentage of the country's over-all population, and where there is a wide gap in EA populations depending on whether the populations are in a crowded area or in a less crowded area, it is recommended that the first and second moments should be calculated for the average size and standard deviation for urban and rural areas.